

CERTIFIED FOR PUBLICATION

IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
THIRD APPELLATE DISTRICT
(Sacramento)

ENVIRONMENTAL LAW FOUNDATION,

Plaintiff and Appellant,

v.

STATE WATER RESOURCES CONTROL BOARD,

Defendant and Respondent;

EAST SAN JOAQUIN WATER QUALITY
COALITION,

Real Party in Interest and Respondent;

SAN JOAQUIN COUNTY RESOURCE
CONSERVATION DISTRICT et al.,

Intervenors and Respondents.

PROTECTORES DEL AGUA SUBTERRANEA,

Plaintiff and Appellant,

v.

STATE WATER RESOURCES CONTROL BOARD,

C093513

(Super. Ct. No.
34201880002851CUWMGDS)

ORDER MODIFYING
OPINION

[NO CHANGE IN
JUDGMENT]

(Super. Ct. No.
34201880002852CUWMGDS)

Defendant and Respondent;

CENTRAL VALLEY REGIONAL WATER
QUALITY CONTROL BOARD et al.,

Real Parties in Interest and Respondents;

SAN JOAQUIN COUNTY RESOURCE
CONSERVATION DISTRICT et al.,

Intervenors and Respondents.

MONTEREY COASTKEEPER et al.,

Plaintiffs and Appellants,

v.

STATE WATER RESOURCES CONTROL BOARD
et al.,

Defendants and Respondents;

EAST SAN JOAQUIN WATER QUALITY
COALITION et al.,

Intervenors and Respondents.

(Super. Ct. No.
34201880002853CUWMGDS)

THE COURT:

It is ordered that the published opinion filed herein on March 17, 2023, be modified as follows:

1. At page 11, in the third paragraph, modify the sentence that begins with “The State Water Board adopted” so that it reads in its entirety:

The State Water Board adopted the Antidegradation Policy in response to an earlier iteration of this directive.

2. At page 26, in the second sentence of the second full paragraph, “In additional” should be modified to say “In addition” so that the sentence reads in its entirety:

In addition to verification of proper [management practice] implementation (Key Element 2), feedback mechanisms are needed to clearly indicate whether and when additional or different [management practices] or [management practice] implementation measures must be used, or other actions taken.

3. At page 58, before the first paragraph that begins with “Finally, Protectores argues the State Water Board misinterpreted or misapplied *AGUA*” add a subheading numbered and worded as follows:

3. *Application of AGUA*

There is no change in the judgment.

/S/

ROBIE, Acting P. J.

/S/

MAURO, J.

/S/

RENNER, J.

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(Super. Ct. No.
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APPEAL from judgments of the Superior Court of Sacramento County, Steven M. Gevercer, Judge. Affirmed.

James R. Wheaton, Lowell Chow and Nathaniel H. Kane for Plaintiff and Appellant Environmental Law Foundation.

Leadership Counsel for Justice and Accountability, Michael K. Claiborne and Phoebe S. Seaton for Plaintiff and Appellant Protectores del Agua Subterranea.

Deborah A. Sivas, Matthew J. Sanders, Stephanie L. Safdi; Helen H. Kang, Lucas C. Williams; California Rural Legal Assistance and Marisol F. Aguilar for Plaintiff and Appellant Monterey Coastkeeper.

Rob Bonta, Attorney General, Robert W. Byrne, Assistant Attorney General, Tracy L. Winsor, Evan Eickmeyer, Allison Goldsmith and Sierra Arballo, Deputy Attorneys General, for Defendant and Respondent State Water Resources Control Board and for Real Party in Interest and Respondent Central Valley Regional Water Quality Control Board.

Kahn, Soares & Conway and Theresa A. Dunham for Real Party in Interest and Respondent East San Joaquin Water Quality Coalition and for Intervener and Respondent Kings River Watershed Coalition Authority.

Spaletta Law and Jennifer L. Spaletta for Intervener and Respondent San Joaquin County Resource Conservation District.

Kari E. Fisher for Intervener and Respondent California Farm Bureau Federation.

I. INTRODUCTION

The Central Valley is home to some of the most productive agricultural land in the nation. But some of the same practices that have made the Central Valley an agricultural powerhouse have also adversely impacted the region's water quality and environmental health. Runoff from irrigated lands comes into contact with fertilizers and pesticides used to produce crops at industrial scales. Fertilizers produce nitrates, which can percolate into groundwater and contaminate drinking water, endangering public health. Pesticides can be carried to groundwater or enter surface waters, threatening aquatic life. Even irrigation water poses a threat to water quality, as concentrated levels of salt from long-term irrigation adversely affects groundwater.

Regulating waste discharges from irrigated agriculture involves an unusually complex set of policy judgments and trade-offs. Regulators must balance the need to ensure a reliable food supply and preserve the economic viability of agriculture against

the need to protect the waters of the state. They must consider the economic and technological feasibility of monitoring minute concentrations of waste emanating from numerous dispersed activities over a vast area. Respondents State Water Resources Control Board (State Water Board) and Central Valley Regional Water Quality Control Board (Central Valley Water Board) are responsible for regulating waste discharges from irrigated agricultural operations in the Central Valley. (Wat. Code, § 13263.)¹ The State and Central Valley Water Boards have traditionally worked with growers to address water quality issues, often through third-party grower/discharger coalitions. Respondent and real party in interest East San Joaquin Water Quality Coalition (Coalition) is one such third-party.

The State Water Board adopted order WQ 2018-0002 (Order) in February 2018. The Order authorizes discharges from irrigated lands to waters of the state within the Eastern San Joaquin River Watershed (watershed) and assigns monitoring and reporting responsibilities to the Coalition and growers within the watershed who are members of the Coalition (Members).²

As relevant here, the Order requires that Members meet receiving water limitations and implement management practices that minimize waste discharge to surface water and groundwater and protect wellheads from surface water intrusion. The Order further requires that Members conduct farm evaluations describing implemented management practices and prepare and implement nitrogen management plans.

¹ Undesignated statutory references are to the Water Code.

² The watershed region encompasses all of Madera, Tuolumne, and Mariposa counties, and portions of Stanislaus, Merced, Calaveras, Fresno, and Alpine counties. There are approximately one million acres of irrigated lands in the watershed region, on which over 100 crops are grown, predominantly almonds, hay, silage, corn, grapes, tomatoes, irrigated pasture, wheat, cotton, and walnuts.

The Order assigns a separate set of responsibilities to the Coalition (sometimes called the “Third Party”). Specifically, the Order requires that the Coalition collect data from Members regarding management practice implementation and nitrogen management plans and report aggregated results to the Central Valley Water Board. The Coalition must also conduct surface and groundwater quality monitoring, and prepare and implement management plans when exceedances of water quality objectives occur.

Perhaps most importantly, the Order adopts new metrics for reporting nitrogen use. The Order applies to Members and establishes precedential guidance for agricultural regulatory programs statewide.³

Environmental Law Foundation (Foundation), Monterey Coastkeeper (Coastkeeper), and Protectores del Agua Subterranea (Protectores) (together, appellants) brought petitions for writs of mandate challenging various aspects of the Order. The trial court consolidated the cases and granted a motion for leave to intervene by the Coalition and others (cumulatively, the Coalition). Following a hearing on the merits, the trial court denied the petitions.

Appellants appeal, advancing numerous claims of error. The Foundation argues the Order violates the State Water Board’s policy for implementation and enforcement of the nonpoint source pollution control program (the Nonpoint Source Policy) by: (1) keeping data secret; (2) failing to provide sufficient feedback mechanisms; and (3) failing to require permanent recordkeeping.

Coastkeeper argues the Order violates the Nonpoint Source Policy by: (1) failing to describe specific management practices; and (2) failing to include sufficient feedback mechanisms.

³ A majority of growers operating irrigated lands in the watershed are members of the Coalition.

Protectores argues the Order violates resolution No. 68-16, statement of policy with respect to maintaining high quality of waters in California, also known as the antidegradation policy (the Antidegradation Policy) because the State Water Board and Central Valley Water Board: (1) failed to make required findings; and (2) improperly distinguished the opinion of another panel of this court in *Asociacion de Gente Unida por el Agua v. Central Valley Regional Water Quality Control Bd.* (2012) 210 Cal.App.4th 1255 (AGUA).

We will reject these arguments and affirm the judgments.

II. BACKGROUND

A. Statutory and Regulatory Framework

The Porter-Cologne Water Quality Control Act (Act) (§ 13000 et seq.) governs water quality regulation in California. The Act establishes as state policy that “activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” (§ 13000.) The Act is administered by the State Water Board and nine regional water quality control boards (Regional Boards), including the Central Valley Water Board. (§§ 13001, 13200.) The State Water Board formulates statewide water quality control policies and oversees the Regional Boards. (§§ 13100, 13140-13141, 13146, 13200-13201, 13240.) Together, the State Water Board and Regional Boards are charged with “primary responsibility for the coordination and control of water quality.” (§ 13001.)

1. Basin Plans and Waste Discharge Requirements

Regional Boards formulate water quality control plans for their regions, commonly known as “basin plans.” (§§ 13240, 13245; see also *Monterey Coastkeeper v. California Regional Water Quality Control Board* (2022) 76 Cal.App.5th 1, 8 (*Monterey Coastkeeper II*)). Basin plans must specify, for the waters within the region, the

beneficial uses to be protected (e.g., drinking water supply, agricultural water supply, freshwater habitat), applicable water quality objectives, and a program of implementation for achieving those objectives. (§ 13050, subs. (h)-(j)(1)-(3); *Monterey Coastkeeper II*, *supra*, at p. 8.) Water quality objectives set “the limits or levels of water quality constituents or characteristics for reasonable protection of beneficial uses of water or the prevention of nuisance in the specific area.” (*County of Sacramento v. State Water Resources Control Board* (2007) 153 Cal.App.4th 1579, 1583.)

Regional Boards are also responsible for regulating discharges of waste through “permitting, inspection, and enforcement actions.” (*Monterey Coastkeeper II*, *supra*, 76 Cal.App.5th at p. 8.) The Act generally requires that any person “discharging waste, or proposing to discharge waste,” file a report with the Regional Board. (§ 13260, subd. (a)(1).) The Regional Board must then “ ‘prescribe requirements as to the nature’ of the discharge, implementing any applicable water quality control plans.” (*Department of Finance v. Commission on State Mandates* (2016) 1 Cal.5th 749, 756.) Such “waste discharge requirements” (WDRs) are similar to permits, inasmuch as they authorize persons to make specified discharges in accordance with specified requirements. (§§ 13263, subd. (f), 13264, 13265, 13374.)⁴

The State Water Board or a Regional Board may also “prescribe *general* waste discharge requirements for a *category* of discharges.” (§ 13263, subd. (i), *emphases added*.) General waste discharge requirements may be appropriate where discharges are produced by the same or similar operations, involve the same or similar types of waste, require the same or similar treatment standards, and are more appropriately regulated under general discharge requirements than individual ones. (*Ibid.*) The Order sets forth

⁴ As we shall discuss, the Order started out as a set of WDRs.

general waste discharge requirements for a category of growers; namely, Members of the Coalition.

“Basin plans cover both point source and nonpoint source pollution.” (*Monterey Coastkeeper v. State Water Resources Control Board* (2018) 28 Cal.App.5th 342, 348 (*Monterey Coastkeeper I*.) Point source pollution emanates from discrete or discernable sources, such as pipes, ditches, or canals. (*Ibid.*) Nonpoint source pollution, by contrast, “arises from many dispersed activities over large areas, and is not traceable to any single discrete source.” (*League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Forsgren* (9th Cir. 2002) 309 F.3d 1181, 1184.) Nonpoint source pollution typically results from “contact between pollutants and land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification.” Examples of nonpoint source pollution include runoff from animal grazing operations (*Monterey Coastkeeper I, supra*, at p. 348), and runoff from irrigated agricultural and silvicultural activities (*Oregon Natural Resources Council v. U.S. Forest Service* (1987) 834 F.2d 842, 849, fn. 9). We are concerned here with discharges from irrigated lands that directly or indirectly reach waters of the state (including surface waters and groundwaters) and may thus be nonpoint source pollution.⁵

Nonpoint source pollution presents unique regulatory challenges, which cannot be readily addressed by strategies designed to control point source pollution. (*League of Wilderness Defenders/Blue Mountains Biodiversity Project v. Forsgren, supra*, 309 F.3d at p. 1184 [“Because it arises in such a diffuse way, [nonpoint source pollution] is very difficult to regulate through individual permits”].) These challenges are especially acute in the context of irrigated agriculture, where “the same activities that are essential to producing a crucial, reliable food supply—e.g. pesticide use to control pests, nitrogen to

⁵ We note that discharges from irrigated lands are not themselves waste but may contain constituents considered to be waste under section 13050, subdivision (d).

fertilize crops, irrigation to water crops—also underlie many of its critical impacts.” Regulatory programs aimed at reducing nonpoint source pollution “ ‘typically depend, at least in part, upon discharger implementation of management practices (MPs) to control nonpoint sources of pollution.’ ” (*Monterey Coastkeeper I, supra*, 28 Cal.App.5th at p. 349.)

2. *State Water Policies*

Basin plans must be consistent with “state policy for water quality control.” (§ 13240; *Monterey Coastkeeper I, supra*, 28 Cal.App.5th at p. 349.) As indicated above, two such policies are relevant here: the Nonpoint Source Policy and the Antidegradation Policy. We provide an overview of each policy here, adding greater detail in the analysis to come.

a. *The Nonpoint Source Policy*

The Act requires that the State Water Board “prepare a detailed program for the purpose of implementing the state’s nonpoint source management plan.” (§ 13369, subd. (a).) The State Water Board adopted the Nonpoint Source Policy in May 2004 in response to this directive. (*Monterey Coastkeeper II, supra*, 76 Cal.App.5th at p. 9; Cal. Code Regs., tit. 23, § 2915.)

The Nonpoint Source Policy provides guidance for structuring nonpoint source pollution control implementation programs to achieve water quality objectives. The Nonpoint Source Policy recognizes that the challenges to implementing such programs are “significant.” The Nonpoint Source Policy explains: “Current land use management practices that have resulted in [nonpoint source] pollution have a long and complicated physical, economic and political history. In addition to the need for resources, forging a new history of pollution control will take time and commitment, as well as a willingness to examine the use of practices that have resulted in current [nonpoint source] pollution discharges and the barriers to change. Therefore, it is expected that it will take a significant amount of time for the [Regional Boards] to approve or endorse [nonpoint

source] control implementation programs throughout their regions, and even longer for those programs to achieve their objectives.”

The Nonpoint Source Policy encourages Regional Boards to be “as creative and efficient as possible in devising approaches to prevent or control [nonpoint source] pollution.” The Nonpoint Source Policy emphasizes that Regional Boards “have broad flexibility and discretion in using their administrative tools to fashion [nonpoint source] management programs,” and approves reliance on third-party programs to “avoid unnecessary duplication of effort” and leverage the State and Regional Water Boards’ limited staffing and financial resources.

The Nonpoint Source Policy requires that nonpoint source control implementation programs incorporate five key elements. (*Monterey Coastkeeper I, supra*, 28 Cal.App.5th at p. 349.) The key elements are as follows:

“KEY ELEMENT 1: [A nonpoint source] control implementation program’s ultimate purpose shall be explicitly stated. Implementation programs must, at a minimum, address [nonpoint source] pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.”

“KEY ELEMENT 2: [A nonpoint source] control implementation program shall include a description of the [management practices] and other program elements that are expected to be implemented to ensure attainment of the implementation program’s stated purpose(s), the process to be used to select or develop [management practices], and the process to be used to ensure and verify proper [management practice] implementation.”

“KEY ELEMENT 3: Where a [Regional Board] determines it is necessary to allow time to achieve water quality requirements, the [nonpoint source] control implementation program shall include a specific time schedule, and corresponding quantifiable milestones designed to measure progress toward reaching the specified requirements.”

“KEY ELEMENT 4: [A nonpoint source] control implementation program shall include sufficient feedback mechanisms so that the [Regional Board], dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different [management practices] or other actions are required.”

“KEY ELEMENT 5: Each [Regional Board] shall make clear, in advance, the potential consequences for failure to achieve [a nonpoint source] control implementation program’s stated purposes.” (See also Cal. Code Regs., tit. 23, § 2915 [summarizing the Nonpoint Source Policy’s key elements].)⁶

b. The Antidegradation Policy

Federal regulations require that states develop and adopt antidegradation policies to ensure that “[e]xisting instream water uses and the level of water quality necessary to protect [those] uses [are] maintained and protected.” (40 C.F.R. § 131.12(a).) The State Water Board adopted the Antidegradation Policy in response to this directive. (*AGUA, supra*, 210 Cal.App.4th at p. 1261.)

The Antidegradation Policy establishes a state policy to regulate the granting of permits and licenses for the disposal of wastes into the waters of the state “so as to achieve the ‘highest water quality consistent with maximum benefit to the people of the State.’ ” (*AGUA, supra*, 210 Cal.App.4th at p. 1262.) The Antidegradation Policy applies where an activity will discharge waste into “high quality waters,” defined as “the best water quality achieved since the adoption of the antidegradation policy by the [State Water Board] in 1968.” (*Id.* at p. 1259.) It is undisputed the Antidegradation Policy applies to the Order.

⁶ As we shall discuss, each of the key elements appears in underlined text (as above), followed by several paragraphs of non-underlined text. Some of the parties disagree as to which text, exactly, constitutes each key element. We will conclude that the underlined text constitutes the key element, and the non-underlined text constitutes commentary.

B. The Order

The Central Valley Water Board issued an order establishing general waste discharge requirements (General WDRs) for Members in December 2012. (§§ 13263 & 13267.) The State Water Board received petitions challenging the General WDRs. The State Water Board reviewed and revised the General WDRs, incorporating recommendations from an agricultural expert panel (Panel) and nitrogen tracking task force (Task Force). The State Water Board adopted the Order in February 2018. The Order embraces the basic structure and requirements of the General WDRs, but adopts new metrics for reporting nitrogen use, requires more specificity in reporting management practice implementation, and expands surface and groundwater quality monitoring programs.

The Order establishes receiving water limitations for surface water and ground water in the watershed, and includes the following statement of “ultimate purpose”:
“Wastes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives in surface water [or underlying groundwater], unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.”

The Order contemplates that compliance with receiving water limitations will be achieved in three steps. First, all Members must implement management practices that minimize waste discharge in surface water, minimize percolation of waste to groundwater, and protect wellheads from surface water intrusion.⁷ Members must record

⁷ The Order defines “management practices,” as they pertain to the protection of water quality, as “[a] practice or practice or combination of practices that is the most effective and practicable (including technological, economic, and institutional considerations) means of controlling nonpoint pollutant sources at levels protective of water quality.”

and report implemented management practices in farm evaluations, irrigation and nitrogen management plans, and irrigation and nitrogen summary reports.

Second, Members are required take additional action where conditions suggest the existence of possible water quality problems. Some Members may be required to obtain additional training or employ an expert for certification of an irrigation and nitrogen management plan. Others may be required to prepare sediment and erosion control plans or management practice implementation reports. The Coalition, for its part, may be required to prepare surface quality management plans or groundwater quality management plans.

Third, the Central Valley Water Board must verify that implemented management practices are effective in addressing water quality problems. To facilitate verification, the Order requires that the Coalition aggregate and anonymize data from Members' farm evaluations and irrigation and nitrogen summary reports. The Coalition then uses the data to prepare tables for submission to the Central Valley Water Board. We will describe the process by which the Coalition aggregates and summarizes information from farm evaluations and irrigation and nitrogen summary reports in the discussion of farm evaluations and irrigation and nitrogen summary reports *post*. Having considered the structure of the Order, we now take a closer look at some of its more salient requirements.

1. Planning and Reporting

As noted, the Order requires that Members prepare plans and reports addressing implemented management practices and nitrogen use. The most significant of these, for our purposes, are farm evaluations, irrigation and nitrogen management plans, and irrigation and nitrogen summary reports. Also significant, though less so, are sediment and erosion control plans and management practice implementation reports.

a. Farm Evaluations

The Order requires that all Members prepare and submit farm evaluations describing implemented management practices and identifying farms by location, type and acreage of crops, surface water discharge points, and wells. Farm evaluations are prepared on a form approved by the Central Valley Water Board. Members must submit completed farm evaluation forms to the Coalition every five years, unless water quality conditions suggest that more frequent reporting may be appropriate. The Coalition then aggregates and summarizes the information for the Central Valley Water Board. It is here that one of the Foundation's principal points of contention arises.

The Order directs the Coalition to permanently associate each Member with a unique, anonymous identifier (an Anonymous Member ID). The Order further directs the Coalition to submit management practice implementation data from farm evaluations to the Central Valley Water Board for each field (or other reporting area) in tabular form, with each field linked to an Anonymous Member ID (Table 1). As we shall see, Table 1 is one of four tables required by the Order. Samples of Tables 1 through 4 are attached as an appendix to this opinion.

The Order directs the Coalition to submit Table 1 to the Central Valley Water Board. The Central Valley Water Board can then analyze the data for trends in management practice implementation. The Central Valley Water Board can also request individual field-level data from the Coalition. As we shall discuss, the Foundation contends the anonymization of farm evaluation data violates key element four of the Nonpoint Source Policy.

b. Irrigation and Nitrogen Management Plans and Irrigation and Nitrogen Management Summary Reports

The Order acknowledges that nitrate pollution in groundwater is a significant public health threat in parts of the Central Valley.⁸ High levels of nitrates in on-farm drinking water supply wells impact public health. Nitrates consumed in water at concentrations above the maximum contaminant level of 10 milligrams per liter pose especially serious risks to pregnant women and infants.

The Order directs Members to prepare two types of reports regarding nitrogen use: irrigation and nitrogen management plans, and irrigation and nitrogen summary reports. Irrigation and nitrogen management plans are retained by Members and provided to the Central Valley Water Board upon request. Irrigation and nitrogen management summary reports are submitted to the Coalition annually. The Coalition then analyzes the information and prepares a report for the Central Valley Water Board.

Irrigation and nitrogen management plans and irrigation and nitrogen management summary reports prepared by Members contain “AR data.” AR data refers to nitrogen applied (A) and removed (R) from a field. Nitrogen applied includes nitrogen proactively added to the field from any source, including fertilizers, manure, and irrigation water. Nitrogen removed includes nitrogen present in materials removed from the field or sequestered in permanent plantings.

AR data can be expressed as a ratio (nitrogen applied over nitrogen removed or A/R) or a difference (nitrogen applied minus nitrogen removed or A-R). Both metrics are

⁸ According to one authority: “Consumers who drink from regulated public water systems are generally protected from the health effects of nitrates because the water is treated prior to consumption. However, a significant part of the population in impacted areas obtains drinking water directly from wells or relies on systems smaller than the threshold for regulation. The problem disproportionately impacts socioeconomically disadvantaged populations, including farm workers, and has been a priority issue of advocacy for environmental justice organizations in the Central Valley.” (Wadhvani, *Fertilizers and Nitrates in Drinking Water: State Water Board Tackles the Public Health Threat of Contaminated Groundwater* (2018) 24 *Hastings Env'tl. L.J.* 237, 238-239, footnotes omitted.)

new—so new, in fact, that “[t]here is insufficient information currently available to calculate the R value for most crops.” The Order directs the Coalition to develop coefficients for calculating nitrogen removed by crop and publish them for crops covering 99 percent of all acreage in the watershed by March 2023.

The Order directs Members to *record* AR data in irrigation and nitrogen management plans, and *report* the data to the Coalition in irrigation and nitrogen management plan summary reports.⁹ The Order directs the Coalition to calculate A/R ratio and A-R difference for each Member and each field and report the results to the Central Valley Water Board. The Coalition reports Members’ AR data in anonymized form, similar to the reporting of information from farm evaluations.

The Order explains that some Members view AR data—specifically, total nitrogen applied (A)—as confidential and proprietary. The Order expresses skepticism on this point, noting that “the timing and frequency of nitrogen applications, rather than data regarding the total amount, [is] more likely to implicate competitive business practices.” The Order also questions whether “the maintenance of confidentiality, in and of itself, is a legitimate goal of a regulatory program that must have transparency and accountability to the public.” Despite these reservations, the Order acknowledges that “many growers have varying levels of business sophistication, limited experience with regulatory programs, and a reluctance to disclose data that they have never before disclosed to the public.” In recognition of these privacy concerns, the Order concludes the State Water Board should “proceed cautiously at this time and not require more information than we find is necessary to effectively manage the irrigated lands regulatory program and provide the public with the essential assurance that we are doing so.” The Order further concludes that “the goals of the program can be carried out effectively if field-level data

⁹ The term “AR data,” as used in the Order, encompasses both “the multi-year A/R ratio and all data required to be reported in support of that ratio, including the A-R difference.”

is linked to anonymous identifiers, with the Third Party [the Coalition] withholding name and location data, at least in the early stages of the program.” The Order advises, however, that the State Water Board “may require disclosure of name and location data in the future if we find that the framework we adopt here is not functioning properly.”

For the time being, however, the Order requires that the Coalition submit three AR-oriented data sets to the Central Valley Water Board, all in tabular form.¹⁰ First, the Coalition must submit a data set associating each field with an Anonymous Member ID (described above), and displaying the crop grown, the annual A/R ratio, the annual A-R difference, and the three-year A/R ratio, as well as some of the underlying data, on a per acre basis (Table 2). “This data set facilitates comparison of the reported A/R ratio and A-R difference for Members growing the same crop.”

Second, the Coalition must submit a data set associating each field with an anonymous location-identifier (an Anonymous APN ID) and displaying the other information required by the first data set (the crop grown, the annual A/R ratio, etc.) (Table 3). “The purpose of this data set is to track nitrogen application data and its potential impacts with regard to a physical location, where Member data obscures such impacts because Members may be changing the fields they operate from year to year.”

Third, the Coalition must submit a data set aggregating AR data by crop at the township level (Table 4). “The purpose of this data set is to provide researchers and other interested persons township-level data to facilitate trend analysis and nitrogen loading modeling.”

¹⁰ As previously discussed, the Coalition must also submit management practice implementation data from farm evaluations for each field (or other reporting area), with each field linked to an Anonymous Member ID in Table 1.

Taken together, the Order anticipates that the anonymized and aggregated datasets will be “sufficient for the Central Valley Water Board to verify that implemented management practices are making progress towards achievement of the water quality goals of the program,” while respecting Members’ privacy concerns. The Order notes “the Central Valley Water Board may at any time request the names and locations corresponding to the anonymous identifiers.”

c. Sediment and Erosion Control Plans

As previously discussed, the Order imposes additional requirements on some Members where conditions suggest the existence of possible water quality problems. (See Section II.B, *ante*.) Among other things, the Order imposes additional requirements on Members with the potential to cause erosion and discharge sediment that may degrade surface water. Specifically, the Order requires that these Members propose and implement sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment and prepare sediment and erosion control plans. Sediment and erosion control plans are kept by Members and provided to the Central Valley Water Board upon request.

2. Monitoring

The Order requires monitoring of surface water and groundwater to verify current conditions, observe changes over time, and confirm that Members ultimately achieve receiving water limitations. However, the Order recognizes that, “in a landscape-based, nonpoint source program such as the irrigated lands regulatory program, monitoring the numerous and sometimes indeterminate set of all farm discharge points to surface water and groundwater is an impractical, prohibitively costly, and often ineffective method for compliance determination.” Accordingly, the Order emphasizes representative and regional monitoring, rather than farm-specific monitoring. We describe the Order’s monitoring requirements below.

a. *Surface Water Monitoring*

The General WDRs established a framework for monitoring water quality in receiving waters, rather than individual fields or farms. That framework divides the watershed into six zones, each with two “core” sites and additional “represented” sites.¹¹ The two core sites are continuously monitored for two years at a time on an alternating basis. When monitoring reveals an exceedance at a core site, the Coalition monitors the site for an additional year, and evaluates nearby represented sites to determine whether water quality problems may be occurring there as well. The Coalition uploads all monitoring data to the State Water Board’s data system.

The Order maintains the monitoring framework established by the General WDRs. But the Order also acknowledges differing schools of thought with respect to surface water monitoring, with some favoring monitoring of individual fields or farms, and others favoring monitoring of receiving waters. The Order explains that the Panel considered the relative merits of field-specific and receiving water monitoring, and concluded that “monitoring of surface water discharges from individual fields or farms is costly and complicated, as well as subject to serious challenges in identifying the appropriate timing for periodic sampling and coordinating with shifting field crew operations, pesticide applications, and sediment runoff events, and with schedules for lab operations.” The Panel explained: “For surface water issues, the Panel recommends water quality monitoring of receiving water and a clear understanding of the watershed hydrology. Sufficient samples should be taken in the watershed streams to detect if problems do indeed exist. The sampling should be of sufficient density (spatially and temporally) to identify general locations of possible pollution. . . . When/if problems are identified,

¹¹ Represented sites are sites with characteristics similar to the core sites “such that a water quality issue detected at the core site may be an indication of a similar issue at a represented site.”

sampling should move upstream to locate the source of the problem.” The Order adopts the Panel’s recommendation and likewise concludes: “Receiving water monitoring is a reliable and effective methodology for identifying water quality issues without resorting to more costly end-of-field measures.”

Even as the State Water Board preserves the monitoring framework established by the General WDRs, the Order raises questions concerning its sufficiency. As relevant here, the Order queries whether the required surface monitoring “is ‘of sufficient density (spatially and temporally) to identify general locations of possible pollution.’” The Order further queries whether “the current monitoring and reporting program requirements constitute a sufficient feedback system to verify that appropriate management practices are being proposed and implemented.”¹² The Order concludes that these and other questions should be considered as part of an independent peer review.

Accordingly, the Order directs the Central Valley Water Board to implement an expert review process to evaluate the monitoring framework and make recommendations for improvements if needed. In the meantime, the Central Valley Water Board and Coalition “shall continue to implement the existing program.”

b. Groundwater Monitoring

The General WDRs established three requirements for groundwater quality monitoring and management practice assessment and evaluation. First, the General WDRs require preparation of a groundwater quality assessment report, which provides a baseline for groundwater quality conditions in the watershed. Second, the General WDRs require implementation of a management practice evaluation program, in which studies are conducted to evaluate the effectiveness of management practices geared to

¹² As we shall discuss, Coastkeeper contends it does not. (See Section III.C.2, *post.*)

groundwater quality. Third, the General WDRs require groundwater quality trend monitoring to determine regional groundwater quality trends. The Order retains these requirements with modifications not relevant here. But the Order goes a step further, adding new monitoring and reporting requirements for on-farm drinking water supply wells.

The Order explains that nitrates consumed at concentrations above the maximum contaminant level of 10 milligrams per liter can pose serious health risks to pregnant women and infants. To address these risks, the Order requires that Members conduct annual testing of on-farm drinking water supply wells for nitrate concentrations. Results of drinking water supply well monitoring are submitted to a database maintained by the State Water Board, with the location of the well identified by APN number. If monitoring reveals that a maximum contaminant level exceedance for nitrate in a drinking water supply well, the Member must provide notice to well users and the Central Valley Water Board within 10 days. Members are then expected to work with the Central Valley Water Board to provide users with safe drinking water.

c. Surface Water Quality Management Plans and Groundwater Quality Management Plans

The Order imposes additional requirements on Members and the Coalition when water quality objectives are exceeded and irrigated agriculture may have caused or contributed to the exceedance. The Coalition must prepare a surface water quality management plan where a Member exceeds an applicable water quality objective or trigger limit two times in three years, and irrigated agriculture caused or contributed to the exceedance. The Coalition must prepare a groundwater quality management plan where there has been a “confirmed exceedance” of an applicable water quality objectives or trigger limit in a groundwater well, and irrigated agriculture may have caused or

contributed to the exceedance.¹³ The executive officer for the Central Valley Water Board must approve a surface water quality management plan or groundwater quality management plan following public review and comment.

Surface water quality management plans and groundwater quality management plans must identify management practices that will be used to control the exceedance and provide a specific schedule for implementing such practices. The time for complying with a surface water quality management plan or groundwater quality management plan “must be as short as practicable, but may not exceed 10 years” from the time of submission to the executive officer of the Central Valley Water Board. If exceedances continue, the Central Valley Water Board may take further action, including identifying individual sources, revoking the waiver of waste discharge requirements for individual members, and requiring submission of additional waste discharge reports.

Members subject to surface water quality management plans or groundwater quality management plans must submit management practice implementation reports to the Coalition, identifying new or improved management practices implemented to address water quality issues. The Coalition anonymizes and reports the data in a management plan progress report. The management plan progress report is submitted to the Central Valley Water Board annually and includes a list of recommended management practices, an evaluation of management practice effectiveness, and an evaluation of progress in meeting performance goals and schedules.

¹³ The Coalition must also prepare groundwater quality management plans for Members in high vulnerability groundwater areas, where required by applicable basin plans, and where a Regional Board determines that irrigated agriculture has caused or contributed to an exceedance.

3. *Recordkeeping*

Finally, the Order requires that the Coalition maintain records—including nonanonymized and unaggregated farm evaluations, irrigation and nitrogen management summary reports, and management practice implementation reports—for a period of 10 years.

C. *Trial Court Proceedings*

As noted, the State Water Board adopted the Order in February 2018. Appellants filed separate petitions for writ of mandate. The trial court consolidated the cases for trial and granted the Coalition’s motion to intervene. Following briefing and argument, the trial court denied the petitions and entered judgment in favor of the State Water Board, the Central Valley Water Board, and the Coalition. These appeals timely followed.

II. DISCUSSION

A. *Standard of Review*

Our review is governed by section 13330, subdivision (e), which directs us to Code of Civil Procedure section 1094.5. (*AGUA, supra*, 210 Cal.App.4th at p. 1266.) That statute, in turn, asks, “whether the respondent has proceeded without, or in excess of jurisdiction; whether there was a fair trial; and whether there was any prejudicial abuse of discretion. Abuse of discretion is established if the respondent has not proceeded in the manner required by law, the order or decision is not supported by the findings, or the findings are not supported by the evidence.” (Code Civ. Proc., § 1094.5, subd. (b).)

We are tasked here with deciding whether the Order implements state policies for water quality control—the Nonpoint Source Policy and Antidegradation Policy—in the manner required by law. These are questions of law subject to independent review. (*AGUA, supra*, 210 Cal.App.4th at p. 1268; *Hoitt v. Department of Rehabilitation* (2012) 207 Cal.App.4th 513, 522 [“Issues of law raised in a petition for a writ of administrative mandate, including the interpretation of applicable statutes or regulations, are for the courts to resolve de novo”].)

We exercise our independent judgment in interpreting administrative regulations, such as the Nonpoint Source and Antidegradation Policies. (*AGUA, supra*, 210 Cal.App.4th at p. 1267-1268.) We accord an administrative agency’s interpretation of its own regulation considerable weight and deference unless the interpretation is unauthorized or clearly erroneous. (*Lusardi Construction Co. v. California Occupational Safety & Health Appeals Board* (1991) 1 Cal.App.4th 639, 645.) We extend such deference, however, “only where the administrative agency has an interpretive advantage over the court because of the scientific and technical nature of the issues.” (*AGUA, supra*, at p. 1268.) We will not defer to an agency interpretation that “flies in the face of the clear language and purpose of the interpreted provision.” (*Communities for a Better Environment v. State Water Resources Control Board* (2003) 109 Cal.App.4th 1089, 1104.)

The Order may comply with the Nonpoint Source Policy or Antidegradation Policy if the State Water Board made the requisite findings. (*AGUA, supra*, 210 Cal.App.4th at p. 1268.) A trial court exercises its independent judgment to determine whether the State Water Board’s factual findings are supported by the weight of the evidence. (§ 13330, subd. (e); see also *AGUA, supra*, at p. 1267 [“In cases in which the court is authorized to exercise its independent judgment on the evidence, ‘abuse of discretion is established if the court determines that the findings are not supported by the weight of the evidence’ ”].) “In exercising its independent judgment, a trial court must afford a strong presumption of correctness concerning the administrative findings, and the party challenging the administrative decision bears the burden of convincing the court that the administrative findings are contrary to the weight of the evidence.” (*Fukuda v. City of Angels* (1999) 20 Cal.4th 805, 817.)

We review the trial court’s factual determinations on the administrative record for substantial evidence. (*Building Industry Assn. of San Diego County v. State Water Resources Control Board* (2004) 124 Cal.App.4th 866, 879; *Fukuda v. City of Angels*,

supra, 20 Cal.4th at p. 824 [“Even when, as here, the trial court is required to review an administrative decision under the independent judgment standard of review, the standard of review on appeal of the trial court’s determination is the substantial evidence test”]; *AGUA, supra*, 210 Cal.App.4th at p. 1267 [“on appeal from the decision of a trial court that exercises its independent judgment on the evidence, review of the factual determinations of the trial court is limited to substantial evidence”].) “In reviewing the findings, we must determine both whether the weight of the evidence supports the findings, and whether the findings support the decision.” (*AGUA, supra*, at p. 1268.)

B. The Foundation’s Appeal

The Foundation argues the Order fails to implement the Nonpoint Source Policy in the manner required by law. Specifically, the Foundation argues the Order violates key element four, which requires that nonpoint source control implementation programs include “sufficient feedback mechanism[s]” so the Regional Boards and public can determine whether the programs are achieving their stated purposes. According to the Foundation, the Order violates key element four by: (1) keeping data secret; (2) failing to provide sufficient feedback mechanisms; and (3) failing to require permanent recordkeeping. We consider and reject each of these arguments below.

1. Anonymization of Data

The Foundation’s first argument focuses on the Order’s requirements for farm evaluations and nitrogen management plan summary reports. As previously discussed, the Order requires that Members report management practice implementation data in farm evaluations, and AR data in nitrogen management plan summary reports. The Coalition then aggregates and anonymizes the data for submission to the Central Valley Regional Board. The Foundation argues the anonymization of data allows Members to keep data secret, in violation of key element four. We perceive no violation.

We should clarify what we mean by “key element four.” As we have explained, key element four is one of five key elements in the Nonpoint Source Policy. Each key

element appears with one or two sentences of underlined text, followed by several paragraphs of non-underlined text. For example:

“KEY ELEMENT 4: [A nonpoint source] control implementation program shall include sufficient feedback mechanisms so that the [Regional Board], dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different [management practices] or other actions are required.

“Verification measures to determine whether [a nonpoint source] control implementation program is meeting its stated purpose is a key element of all [nonpoint source] control implementation programs. In addition to verification of proper [management practice] implementation (Key Element 2), feedback mechanisms are needed to clearly indicate whether and when additional or different [management practices] or [management practice] implementation measures must be used, or other actions taken. Designing the appropriate types and frequency of verification and feedback measures (e.g., reporting, inspection, monitoring, etc.) is an integral part of implementation program development and success.

“In all cases the [nonpoint source] control implementation program should describe the measures, protocols, and associated frequencies that will be used to verify the degree to which the [management practices] are being properly implemented and are achieving the program’s objectives, and/or to provide feedback for use in adaptive management. These efforts are necessary to determine whether the program is on time and on track in achieving its goals.

“Depending on the water quality problem, the cause, the beneficial uses at risk, and the purpose for which the monitoring will be used (e.g., adaptive management or regulatory purposes) the appropriate type(s) of monitoring should be used. Some monitoring approaches include photo monitoring; assessing residual dry matter on rangelands; various indicators of healthy instream habitat; riparian and wetland habitat structure, density and cover; and bioassessment. Some programs may involve collecting

and reporting ambient water quality monitoring data. Those programs should be consistent with the [State Water Resources Control Board] Surface Water Ambient Monitoring Program (SWAMP) Data Quality Management Plan (DQM), which provides for more than one level of data quality. The DQM approach to data quality recognizes that the rigor needed to monitor for regulatory purposes may not be necessary for other purposes. Consequently, the SWAMP DQM provides data quality and reporting objectives for both regulatory and screening studies. Regardless of which approach is used, all monitoring programs should be reproducible, provide a permanent/documented record and be available to the public.”

The Foundation argues all of the above-quoted language, both underlined and non-underlined, constitutes key element four. The State Water Board, Central Valley Water Board, and Coalition respond that only the underlined language constitutes key element four, and the succeeding paragraphs are commentary. We agree with the latter view, which more closely comports with the usual meaning of the word, “element.” (See, e.g., Merriam-Webster’s Collegiate Dict. (11th ed. 2003) pp. 402-403 (Merriam-Webster) [defining “element,” in part, as “the simplest principles of a subject of study,” and noting that the word “often connotes irreducible simplicity”].)¹⁴ Accordingly, we will refer to the underlined language as “key element four” and the succeeding paragraphs as

¹⁴ We find further support for this view in California Code of Regulations, title 23, section 2915, which summarizes the Nonpoint Source Policy and describes key element four as follows: “4. Feedback mechanisms must be included in the implementation program so that the [Regional Water Quality Control Board], dischargers and the public can determine whether the program is achieving its stated purpose(s), or if additional or other actions are required.” The regulation aptly summarizes the underlined text in the Nonpoint Source Policy and omits the nonunderlined text, suggesting that the State Water Board has consistently treated the underlined text as key element four, and the nonunderlined text as commentary.

commentary. We will follow the same convention in discussing other key elements elsewhere in this opinion.

We now turn to the Foundation's contention that the anonymization of data violates key element four. The Foundation directs our attention to the last sentence of the commentary, which provides, in pertinent part, that "all monitoring programs should be reproducible . . . and . . . available to the public." In the Foundation's view, this sentence prohibits the anonymization of management practice implementation and AR data by the Coalition. We need not decide whether the commentary to key element four prohibits the anonymization of management practice implementation and AR data, because the commentary appears to us to be advisory and nonbinding. Nothing in key element four prohibits the anonymization of management practice implementation and AR data; accordingly, we can readily reject the Foundation's argument.

But even assuming the commentary were part of key element four, we see nothing that would prohibit the anonymization of data. While the commentary says monitoring *programs* "should be" reproducible and publicly available, nothing suggests that monitoring *data* should be reproducible and publicly available. Nor does anything suggest that monitoring data *must be* reproducible and publicly available, as the Foundation would have us conclude.

The State Water Board, in implementing the Nonpoint Source Policy, could reasonably construe the comments to key element four as a recommendation that the plan or system by which the Coalition collects information "should be" reproducible and available to the public, while the underlying information need not be. The State Water Board could also reasonably conclude that the requirements for reporting management practice implementation data from farm evaluations and AR data from nitrogen management plan summary reports could and should strike an appropriate balance between transparency, on the one hand, and confidentiality on the other. The Order reveals that the State Water Board considered the challenges involved in launching a new

regulatory program, including Members' confidentiality concerns, and exercised discretion to "proceed cautiously," requiring no more information than necessary to manage the program. The State Water Board could reasonably determine, in the exercise of its discretion, that such an approach was necessary and desirable to build support for the program and allay Members' concerns.¹⁵ (See *Monterey Coastkeeper II*, *supra*, 76 Cal.App.5th at p. 19 ["Application of the [Nonpoint Source] Policy necessarily involves discretionary acts by the regional and state boards"].)

The Foundation argues the State Water Board had no such discretion. In the Foundation's view, the Nonpoint Source Policy leaves the State Water Board with no choice but to make all monitoring data public. The Foundation's argument is not supported by the Nonpoint Source Policy. Even accepting the premise that "monitoring programs" are coextensive with "monitoring data," the commentary says only that such programs "should be" reproducible and available to the public, not that they must be. (See, e.g., *Kucera v. Lizza* (1997) 59 Cal.App.4th 1141, 1152 [the words "may" and "should" are ordinarily permissive]; *Boam v. Trident Financial Corp.* (1992) 6 Cal.App.4th 738, 745, fn. 6 ["should" used in the present or future tense, while more forceful than "may," can convey only a moral obligation or strong recommendation]; *United States v. Marcucci* (9th Cir. 2002) 299 F.3d 1156, 1159 [unlike "shall" or "must," the word "should" leaves discretion to do otherwise].) The commentary thus makes clear that the State Water Board has discretion to decide whether and to what extent monitoring programs—and data—should be reproducible and available to the public. We

¹⁵ The Order explains: "We heard extensive testimony in these proceedings from third parties and growers stressing that the continuation of a third-party framework in irrigated lands regulatory programs depends in part on an expectation of privacy and confidentiality for growers who prefer to interface with a third party rather than the regulatory agency."

cannot say the State Water Board abused its discretion in deciding that Members' names and locations should be anonymized, if only for the time being. Nor can we say that the State Water Board's interpretation and implementation of the commentary "flies in the face of the clear language and purpose" of the Nonpoint Source Policy. (*Communities for a Better Environment v. State Water Resources Control Board*, *supra*, 109 Cal.App.4th at p. 1104.) Accordingly, we reject the Foundation's argument.¹⁶

2. *Sufficiency of Feedback Mechanisms*

The Foundation's second argument focuses, again, on the anonymization of management practice implementation data from farm evaluations and AR data from nitrogen management plan summary reports. As before, the Foundation argues the Order's reporting rules violate key element four. Where before the Foundation argued the anonymization of data constitutes a violation of key element four's commentary, the Foundation now argues the anonymization of data violates the requirement that nonpoint source control implementation programs include "sufficient feedback mechanism[s]." Again, we disagree.

As previously discussed, key element four requires that nonpoint source control implementation programs include "sufficient feedback mechanism[s]" so the Regional Board and public "can determine whether the program is achieving its stated purpose(s)." The Order describes the required feedback mechanism, in part, as one that allows a

¹⁶ The Foundation raises a related claim, which warrants only brief mention. The trial court's ruling states: "As the Coalition aggregates and summarizes the field-level data provided by individual Members, before sending it to the Regional Board, this program is reproducible and publicly available." The Foundation characterizes this part of the trial court's ruling as a "finding" that the monitoring program is reproducible, which fails for lack of supporting evidence. Given our conclusion that the Nonpoint Source Policy does not require that monitoring data be reproducible and available to the public, we deem it unnecessary to consider whether the trial court made any "finding" concerning reproducibility, and if so, whether it was supported by the evidence.

nonpoint source control program to “link its implementation requirements, with some level of confidence, to expected water quality outcomes, and incorporate monitoring and reporting sufficient to verify that link.” The Foundation argues the Order does not provide sufficient feedback mechanisms, because aggregated and anonymized data does not allow any direct correlation between Members’ management practice implementation and their locations, and thus fails to provide the necessary “link.”

The Foundation is correct in saying the Order offers an imperfect window into Members’ management practice implementation and water quality outcomes. That point is well illustrated by the previously described tables. To reiterate, the Order requires the Coalition to prepare and submit four tables to the Central Valley Water Board. Table 1 reflects management practice implementation data from farm evaluations, with each field linked to an Anonymous Member ID. Table 2 reflects field-level AR data by Anonymous Member ID. Table 3 reflects field-level AR data by Anonymous APN ID. Table 4 reflects township-level AR data.

As the Foundation observes, Tables 1 and 2 provide the Central Valley Water Board and public with information concerning Members’ management practice implementation and AR data, respectively, but no information concerning their identities or locations. Tables 3 and 4 provide the Central Valley Water Board and public with information concerning Members’ AR data by field and township, respectively, but no information concerning their management practice implementation. None of the tables, by themselves, allow the Central Valley Water Board or public to correlate any particular Member’s management practices with that Member’s location. Without location data, the Foundation argues, the Central Valley Water Board and public cannot connect management practice implementation requirements to water quality results, and cannot

know whether the program is achieving its stated purposes. The State Water Board found otherwise.¹⁷

The State Water Board found “anonymous field-level data is sufficient for the Central Valley Water Board to verify that implemented management practices are making progress toward achievement of the water quality goals of the program.” The State Water Board noted the Central Valley Water Board could always request Members’ names and locations from the Coalition. The State Water Board also noted the public could always request that the Central Valley Water Board obtain targeted data from the Coalition. According to the Order, “all data obtained by the Central Valley Water Board

¹⁷ The State Water Board devoted considerable attention to the question whether the Order could rely on aggregated and anonymous data and still provide sufficient feedback mechanisms. The State Water Board described its thought process as follows: “Instituting effective management practices requires sufficient monitoring and reporting to determine if existing management practices are leading to compliance with water quality requirements and implementation of improved water quality practices where they are not. This feedback mechanism—that a nonpoint source discharge control program link its implementation requirements, with some level of confidence, to expected water quality outcomes, and incorporate monitoring and reporting sufficient to verify that link—is a fundamental tenet of the Nonpoint Source Policy, captured in Key Elements 1, 2, and 4. But the Nonpoint Source Policy does not specify a particular level of granularity in monitoring and reporting and therefore leaves significant discretion to the water boards to determine the appropriate level of data gathering and reporting for different programs and different program components. The water boards must strike a balance that, on the one hand, requires sufficient data collection and reporting to allow for meaningful feedback on the program, but, on the other hand, avoids extensive data requirements that demand excessive and unwarranted time and cost to produce and analyze by the growers, the third party, and water board staff. In striking that balance, the water boards also take into consideration grower concerns with disclosure of trade secrets, private economic and proprietary business information, and general concerns regarding privacy.”

will be subject to public disclosure in accordance with the Public Records Act.”¹⁸

Accordingly, the State Water Board concluded the Order’s feedback mechanisms were sufficient, at least for present purposes.¹⁹

The trial court independently reviewed the administrative record and determined the State Water Board’s finding was supported by the weight of the evidence. (§ 13330, subd. (e); see also *AGUA, supra*, 210 Cal.App.4th at p. 1267.) The trial court relied, in part, on evidence in the administrative record from Dr. Thomas Harter, professor and chair of water management policy at the University of California, Davis. Dr. Harter testified before the State Water Board as part of the petition review process on May 17, 2016. He emphasized that nonpoint source pollution arises from dispersed activities over large areas, which cannot be traced to any single source. Discharges from nonpoint sources may be transported to groundwater laterally across the landscape, from places of higher water table to places of lower water table. Those waters may mix with other waters from different places and periods of time, making it “very difficult” to say which growers may have been responsible for which discharges. As a result, Dr. Harter said, “if I’m asked to tell you where water comes from in any particular well, I couldn’t point to an area that’s much smaller than a township.” Given these uncertainties, Dr. Harter opined that aggregated data at the township level would be “completely sufficient” for assessing water quality outcomes and analyzing long-term trends.²⁰

¹⁸ We express no opinion as to the availability of such materials under the Public Records Act.

¹⁹ The Order notes that the State Water Board may require that an APN-based location identifier be added to a separate table in the future, if it later determines that management practices should be tied to a fixed location.

²⁰ Dr. Harter summarized his testimony in a comment letter to the State Water Board, in which he reiterated that “aggregated information, for each crop in each township, on total A, total R, and mean A/R and their respective areas, provides sufficient information to

The trial court also relied on a report by the Panel entitled, “Conclusions of the Agricultural Expert Panel: Recommendations to the State Water Resources Control Board pertaining to the Irrigated Lands Regulatory Program” (the Report). The Report observes that regulatory data collection efforts have traditionally placed a premium on “understanding how nitrate moves into first-encountered groundwater, how the groundwater moves, and how nitrate levels in the groundwater might be related to surface water.” The Report explains: “Collecting data on changing nitrate levels in the groundwater, to indicate success or failure of overlying surface [nitrogen] management practices on individual fields and farms directly above a data collection point, is typically problematic at best.” This is so, the Report says, because total nitrogen loads depend upon the concentration and flow of deep percolation, which are extremely difficult to estimate with any degree of accuracy. In light of these uncertainties, the Report recommends that data be evaluated on a multi-year basis, rather than annually. The Report explains: “It is emphasized that the collected data should be used to examine regional, multiple-year conditions and trends of nitrogen applications. Analysis of these data on too-short time frames (e.g., year-to-year) will introduce random error and potentially misleading results because many confounding variables, such as residual soil nitrogen and nitrogen removal rates, vary by year and by crop rotation. These differences tend to even out over multiple years. It is also emphasized that the data should not be used for regulatory enforcement because the possibility of regulatory consequences will compromise the accuracy of the data.”

The trial court weighed Dr. Harter’s expert opinion and the Report against the Foundation’s evidence, which consisted of a single comment letter to the State Water

guide regulators with information needed to implement the program and assess and evaluate the potential nitrate discharges to groundwater and trends in such discharges.”

Board.²¹ The trial court found the comment letter failed to establish a violation of key element four, a conclusion the Foundation does not challenge. Instead, the trial court found the weight of the evidence supported findings that “aggregated data is sufficient” and “individual data points are not necessary and may be misleading.”

The Foundation argues Dr. Harter’s expert opinion and the Report are not substantial evidence supporting the finding that aggregated and anonymous feedback mechanisms are sufficient. The Foundation offers two reasons why the evidence was supposedly not substantial. First, the Foundation observes Dr. Harter’s expert opinion and the Report predate the State Water Board’s adoption of the Order in February 2018, and thus cannot be seen as commenting on the feedback mechanisms in the final version. Second, the Foundation argues the Order’s data collection and reporting requirements are “more granular” than the feedback mechanisms suggested by Dr. Harter’s expert opinion and the Report, and thus reveal that the State Water Board disagreed with these views. The Foundation’s arguments are unavailing.

The usual meaning of “substantial evidence” is “evidence that is ‘of ponderable legal significance,’ ‘reasonable in nature, credible, and of solid value,’ and ‘“substantial” proof of the essentials which the law requires in a particular case.’ ” (*Conservatorship of O.B.* (2020) 9 Cal.5th 989, 1006.) In determining whether evidence is substantial, the test is whether it is “ ‘ “reasonable for a trier of fact to make the ruling in question in light of the whole record.” ’ ” (*In re Yolanda L.* (2017) 7 Cal.App.5th 987, 992; see also Code Civ. Proc., § 1094.5, subd. (c) [in administrative mandamus action, court reviews whole record to determine whether findings are supported by substantial evidence].) That Dr.

²¹ The trial court directed the Foundation to identify expert testimony supporting the contention that aggregated and anonymous feedback mechanisms are insufficient. The Foundation identified the comment letter for the first time at the hearing on the merits. The Foundation does not discuss the comment letter in the opening brief, and so we do not consider it either.

Harter's testimony and the report predate the Order does not make them any less substantial. The Foundation does not argue that intervening changes in scientific understanding rendered Dr. Harter's expert opinion or the Report obsolete or unreliable. Nor does the Foundation suggest any other reason Dr. Harter's expert opinion and the Report are not " 'of ponderable legal significance,' 'reasonable in nature, credible, and of solid value.' " (*Conservatorship of O.B., supra*, at p. 1006.)

The State Water Board could reasonably exercise discretion to require "more granular" feedback without rejecting Dr. Harter's opinion that aggregated feedback at the township-level would be sufficient. Likewise, the State Water Board could reasonably exercise discretion to require that Members collect and report field-level data to the Coalition, without undermining the views expressed in the Report. That the Report characterizes individualized data points as problematic does not mean they are not worth collecting or reporting to the Coalition. But it could mean they are ill-suited for use as a feedback mechanism. Regardless, even assuming some minor inconsistency between the Order and Dr. Harter's opinion or the Report, both are substantial proof that aggregated and anonymous feedback mechanisms are sufficient. That the State Water Board elected to require "more granular" feedback mechanisms does not render the evidence insubstantial. The Foundation's challenges to the sufficiency of the supporting evidence lack merit.²²

The Foundation also argues the findings fail to support the State Water Board's decision. This is so, the Foundation says, because only individualized data points can provide sufficient feedback mechanisms, and anything short of that must necessarily be

²² The State Water Board's interpretation and application of the Nonpoint Source Policy is an area where it has " 'expertise and technical knowledge,' " and " 'the legal text to be interpreted is technical, obscure, complex, open-ended, [and] entwined with issues of fact, policy, and discretion.' " (*North Gualala Water Co. v. State Water Resources Control Board* (2006) 139 Cal.App.4th 1577, 1589.)

insufficient. The Foundation finds support for this argument in the Order's statement of ultimate purpose, which the Foundation characterizes as "individual compliance" with receiving water limitations. Building on this premise, the Foundation reasons that compliance must be individual and site specific; therefore, feedback mechanisms must also be individual and site specific. We disagree for two reasons.

First, the Foundation misstates the Order's ultimate purpose. The Order does not express an ultimate purpose of "individual compliance." Rather, the Order says its ultimate purpose is establishing receiving water limitations so "[w]astes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives." The Order holds Members individually responsible for complying with receiving water limitations, but also recognizes the current state of science does not allow regulators to say with certainty that any particular Member has or has not caused or contributed to any particular exceedance. Accordingly, the Order aims to improve water quality outcomes for "Member operations" through implementation of management practices, monitoring, and reporting, rather than "individual compliance." That purpose is narrower than the one the Foundation describes.

Second, and related, the findings support the State Water Board's decision that the Order contains sufficient feedback mechanisms to allow the Central Valley Water Board and public to determine whether the program is achieving its ultimate purpose. As previously discussed, Table 1 discloses implemented management practices at the field-level by Anonymous Member ID. Table 2 discloses field-level AR data by Anonymous Member ID. Neither Table 1 nor Table 2 disclose the location of the field. Nevertheless, the Central Valley Water Board and public can correlate implemented management practices to wastes discharged from Member operations by Anonymous Member ID. Because Anonymous Member IDs are permanently assigned, the Central Valley Water

Board and public can also observe Members' progress towards achieving water quality objectives over time.²³

Table 3 discloses field-level AR data by Anonymous APN. Table 4 discloses AR data at the township level. Together, Tables 3 and 4 allow the Central Valley Water Board and public to correlate wastes discharged from Member operations to water quality objectives by location, albeit not with the specificity the Foundation would like. This is where the real issue lies.

The Foundation would like feedback mechanisms linking Members to management practice implementation data and AR data by field. Only then, the Foundation suggests, would the Central Valley Water Board and public have sufficient feedback mechanisms to know whether the program is achieving its ultimate purpose, that “[w]astes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives.” But even complete datasets with non-anonymized, individual data points would not allow the Central Valley Water Board or public to conclusively establish whether any particular Member has caused or contributed to any particular exceedance, because that cannot currently be determined. The best that current science can do, so far as the administrative record reveals, is to connect nitrate discharges to groundwater at the township-level. The Order does this and more. The Order's feedback mechanisms are thus sufficient for determining whether the program is achieving this purpose.

²³ The Central Valley Water Board and public can also monitor the progress of Members with exceedances, who are subject to surface water quality management plans or groundwater quality management plans, through management practice implementation reports. Those reports identify new or improved management practices implemented to address the exceedance by Anonymous Member ID and Anonymous APN ID.

The Foundation also argues the findings do not support the State Water Board's decision because the Order grants the Central Valley Water Board greater access to information than the public. According to the Foundation, key element four requires that the Central Valley Water Board and the public have equal access to such information. We are not persuaded.

Key element four requires that the Order provide "sufficient feedback mechanisms," not perfect transparency. Nothing in key element four says the public must have access to the same data set as the Central Valley Water Board. The Foundation makes much of the fact that the State Water Board found it "essential to continue to allow the Central Valley Water Board to require submittal of specific names or locations, or names or locations generally, should the Central Valley Water Board make a determination that it is necessary." If the ability to access the complete data set is "essential" for the Central Valley Water Board, the Foundation urges, then the same must be true for the public. But the Central Valley Water Board and the public are not similarly situated with respect to water quality regulation. Moreover, and more importantly, the Nonpoint Source Policy does not require that the public have the same feedback mechanisms as the Central Valley Water Board, only that both have "sufficient" ones. As we have shown, the trial court's finding that the Order provides sufficient feedback mechanisms is supported by substantial evidence, including evidence that individualized data points are "typically problematic." We cannot say that the Order's feedback mechanisms are insufficient as a matter of law merely because they do not provide the public with the same regulatory tools as the Central Valley Water Board. The Foundation's second argument is rejected.

3. *Permanent Recordkeeping*

Finally, the Foundation argues the Order violates key element four by failing to require permanent recordkeeping. The commentary to key element four provides, in pertinent part, that, "all monitoring programs should . . . provide a

permanent/documented record.” The Foundation argues the Order violates the commentary by only requiring that Members and the Coalition maintain records reflecting field-level management practice implementation data and AR data for 10 years. As before, we perceive no violation.

Here, again, the commentary says only that monitoring programs “should . . . provide a permanent/documented record,” not that they must. (See, e.g., *Kucera v. Lizza*, *supra*, 59 Cal.App.4th at p. 1152; *Boam v. Trident Financial Corp.*, *supra*, 6 Cal.App.4th at p. 745, fn. 6; *United States v. Marcucci*, *supra*, 299 F.3d at p. 1159.) The commentary does not mandate that the Order provide a permanent or documented record of the monitoring program, but instead leaves the matter to the State Water Board’s discretion. The State Water Board could reasonably exercise that discretion to require that Members and the Coalition maintain records of field-level management practice implementation data and AR data for 10 years, rather than permanently, given the evidence that aggregated and anonymized data provides a sufficient feedback mechanism, and individualized data points are not helpful. We cannot say that the Order’s recordkeeping requirements fly in the face of the Nonpoint Source Policy. Accordingly, we reject the Foundation’s third and final argument.

C. Coastkeeper’s Appeal

Coastkeeper’s appeal also focuses on the Nonpoint Source Policy. Coastkeeper argued in the trial court that the Order violates every element of the Nonpoint Source Policy, as well as the Antidegradation Policy. Coastkeeper now argues that the Order violates key elements two and four of the Nonpoint Source Policy. We reject these contentions for the reasons discussed below.

1. Key Element Two

Coastkeeper argues the Order violates key element two of the Nonpoint Source Policy. Key element two requires that nonpoint source control implementation programs “include a description of the [management practices] and other program elements that are

expected to be implemented to ensure attainment of the implementation program's stated purpose(s)." (Emphasis omitted.)

The commentary to key element two provides:

"A [Regional Board] must be able to determine that there is a high likelihood that the program will attain water quality requirements. This will include consideration of the [management practices] to be used and the process for ensuring their proper implementation. It also will include other factors such as the level of discharger participation and the effectiveness of the [management practices] implemented.

"[Management practices] must be tailored to a specific site and circumstances, and justification for the use of a particular category or type of [management practice] must show that the [management practice] has been successfully used in comparable circumstances. If [a management practice] has not previously been used, documentation to substantiate its efficacy must be provided by the discharger. A [Regional Board] must be convinced there is a high likelihood the [management practice] will be successful. A schedule assuring [management practice] implementation and assessment, as well as adaptive management provisions must be provided. We recognize that in the earlier stages of some pollution control programs, water quality changes may not be immediately apparent, even with the implementation of pollution control actions. Although [management practice] implementation never may be a substitute for meeting water quality requirements, [management practice] implementation assessment may, in some cases, be used to measure nonpoint source control progress."

Coastkeeper argues the Order violates key element two in two ways. First, Coastkeeper argues the Order fails to include a description of the management practices expected to be implemented to ensure attainment of the program's stated purposes. According to Coastkeeper, the Order gives the appearance of describing specific management practices, but actually offers "only reporting requirements, general instructions, and plans to make plans." None of these things are management practices,

Coastkeeper says. Second, Coastkeeper argues that no evidence supports the finding that the activities required by the Order (whether or not they are management practices) are highly likely to attain water quality requirements. We reject both contentions.

Coastkeeper argues the *Order* violates key element two by failing to describe specific management practices. But key element two applies to nonpoint source control implementation *programs*, not orders. As the State and Central Valley Water Boards observe, the Nonpoint Source Policy defines a nonpoint source control implementation program as “a program developed to comply with [State Water Board or Regional Water Board waste discharge requirements], waivers of [waste discharge requirements], or basin plan prohibitions.” Thus, the State and Central Valley Water Boards assert, the program logically includes both the Order and the contents of the plans that Members and the Coalition must prepare and implement to comply with the Order. This point is well-taken. We therefore consider whether the program as a whole satisfies key element two. We conclude it does.

a. Description of Management Practices

As previously discussed, the Order requires that Members “implement management practices that minimize waste discharge offsite in surface water, minimize percolation waste to groundwater, and protect wellheads from surface water intrusion.” Coastkeeper argues these are “[v]ague instructions to further general goals,” (italics omitted) and we do not disagree. But the Order does not stop there. The Order also requires that all Members prepare planning documents, beginning with farm evaluations, irrigation and nitrogen management plans, and sediment and erosion control plans.

Farm evaluations are prepared with templates approved by the Central Valley Water Board. The templates call for Members to check boxes identifying implemented management practices, including pesticide application practices, primary and secondary irrigation practices, irrigation efficiency practices, nitrogen management practices, and

sediment and erosion control practices. The templates also require that Members certify the accuracy of their responses under penalty of perjury.

Irrigation and nitrogen management plans, irrigation and nitrogen summary reports, and sediment and erosion control plans can also be prepared with templates, if the Coalition so chooses.²⁴ Irrigation and nitrogen management plans and irrigation and nitrogen summary reports must describe irrigation management practices and nitrogen management practices to minimize leaching past the root zone. Sediment and erosion control plans must describe management practices implemented to minimize or eliminate the discharge of sediment above background levels. All such plans and reports must be certified under penalty of perjury by a specialist, or self-certified by a Member who has completed an approved training program. Coastkeeper argues farm evaluations, irrigation and nitrogen management plans, and sediment and erosion control plans are well and good, but they are not management practices, and do not require management practices. We will address this argument momentarily.

Coastkeeper raises similar objections to surface water quality management plans and groundwater quality management plans. As a reminder, the Order requires that the Coalition prepare surface water quality management plans and groundwater quality management plans when water quality objectives are exceeded and irrigated agriculture may have caused or contributed to the exceedance. Surface water quality management plans and groundwater quality management plans must identify management practices that will be used to control exceedances and provide specific schedules for implementing such practices. These requirements may sound substantive, Coastkeeper says, but they are mere “plans to make a plan.” According to Coastkeeper, they do not require Members to implement any particular management practices and leave the selection of

²⁴ The parties do not tell us whether the Coalition has elected to use templates for irrigation and nitrogen management plans and irrigation and nitrogen summary reports.

management practices to the Coalition’s discretion. As such, Coastkeeper contends, surface water quality management plans and groundwater quality management plans cannot be considered management practices either. We disagree.

When the program is viewed as encompassing both the Order and planning and reporting activities required by the Order, it becomes clear that the program as a whole includes an adequate “description of the [management practices] and other program elements that are expected to be implemented to ensure attainment of the implementation program’s stated purpose(s).” (Emphasis omitted.) As previously discussed, the Order requires that Members implement management practices and prepare certified records specifying which management practices have already been implemented and which are expected to be implemented. Together, the Order and planning and reporting activities required by the Order describe the management practices and other program elements that are expected to be implemented, thereby satisfying key element two.

Coastkeeper directs our attention to the commentary to key element two, which require that management practices “be tailored to a specific site and circumstances.” However, all of the above-described plans and reports—farm evaluations, irrigation and nitrogen management plans, irrigation and nitrogen summary reports, sediment and erosion control reports, surface water quality management plans, and groundwater quality management plans—require that Members consider management practices at field level. That being so, we conclude that management practices are “tailored to a specific site and circumstances,” as required by the commentary to key element two.

Coastkeeper also directs our attention to section 13360, which provides, in pertinent part: “No waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order, or decree, and the person so ordered shall be permitted to comply with the order in any lawful manner.” (§ 13360, subd. (a).) Another panel of this court

has explained: “Section 13360 is a shield against unwarranted interference with the ingenuity of the party subject to a waste discharge requirement; it is not a sword precluding regulation of discharges of pollutants. It preserves the freedom of persons who are subject to a discharge standard to elect between available strategies to comply with that standard.” (*Tahoe-Sierra Preservation Council v. State Water Resources Control Board* (1989) 210 Cal.App.3d 1421, 1438; see also *Monterey Coastkeeper I*, *supra*, 28 Cal.App.5th at p. 351 [“Neither a waste discharge requirement nor a waiver thereof is permitted to specify a particular *manner* of compliance with the discharge standard”].) Coastkeeper argues the trial court failed to appreciate that nonpoint source control implementation programs can comply with section 13360 and key element two by “describing specific, tailored management practices and giving growers flexibility to choose among them.” But that is exactly what the templates do: They describe specific, tailored management practices and give Members the flexibility to choose among them. Coastkeeper fails to show that the trial court misapplied section 13360.

Exercising our independent judgment, we conclude the program satisfies key element two by including an adequate description of the management practices and other program elements that are expected to be implemented to ensure attainment of the program’s stated purpose. We therefore reject Coastkeeper’s argument.²⁵

²⁵ Coastkeeper directs our attention to an apparent inconsistency in the trial court’s ruling. The trial court ruled, on the one hand, that the Order “does not specify particular management practices” and, on the other hand, that the Order “requires Members to immediately follow a host of management practices,” including planning and reporting activities. We do not view these statements as necessarily inconsistent. The Order requires Members to immediately implement management practices but does not specify which ones. Management practices are instead specified by the templates required to be completed by Members. We need not resolve the purported inconsistency, as our review focuses on the correctness of the trial court’s ruling, not its reasoning. (*Oiye v. Fox* (2012) 211 Cal.App.4th 1036, 1049.)

b. Sufficiency of Evidence to Support a “High Likelihood” Finding

Coastkeeper argues the program violates key element two in another way. The commentary to key element two provides, in part, that a Regional Board “must be able to determine that there is a high likelihood that the program will attain water quality requirements.” The trial court found the Order provides “a clear link between management practices and outcomes.” Coastkeeper argues the trial court’s finding is not supported by substantial evidence. We disagree.

The trial court found evidentiary support for a “high likelihood” finding in the Order’s three-part structure. As previously discussed, the Order contemplates that: (1) all Members will immediately implement management practices and report those practices to the Coalition through farm evaluations, irrigation and nitrogen management summary reports, and management practice implementation reports; (2) some Members will implement additional management practices as part of a surface water quality management plan or groundwater quality management plan, or receive additional training as AR outliers; and (3) the Coalition will submit field-level data to the Central Valley Water Board, allowing the Central Valley Water Board to verify that Members are implementing management practices leading to improved multi-year A/R ratios or improved water quality results. Substantial evidence supports the trial court’s finding that the program is highly likely to attain water quality requirements.

Irrigation and nitrogen management plans and irrigation and nitrogen management summary reports provide an apt illustration. The Order explains that irrigation and nitrogen management plans and irrigation and nitrogen summary reports are expected to improve water quality outcomes in two ways. First, irrigation and nitrogen management plans require that Members project the total nitrogen a given crop will require for a single cropping cycle. This is done by considering the amount of nitrogen already available in soil and irrigation water, which allows the Member to plan for the appropriate amount of fertilizer to be applied to meet crop requirements. Such planning helps Members avoid

over-application of nitrogen fertilizer that may lead to excess loss of nitrogen to groundwater or surface water. Second, the data contained in irrigation and nitrogen management summary reports enables the Coalition and Central Valley Water Board to consider the range of nitrogen application values reported for similar crops, and allows the Coalition to identify outliers for follow-up actions with the goal of reducing over-application. Thus, the Order anticipates that irrigation and nitrogen management plans will help Members avoid over-application of nitrogen, and irrigation and nitrogen management summary reports will help the Coalition and Central Valley Water Board identify outliers for follow-up. The State Water Board could reasonably expect these management practices would lead to improved water quality outcomes. Substantial evidence thus supports the existence of a link between management practices and water quality outcomes, which in turn supports a finding that the program is highly likely to attain water quality requirements.

Coastkeeper challenges the sufficiency of the evidence, arguing no link can be inferred because the Order depends entirely on things the Coalition and Members may or may not do in the future (such as develop meaningful surface water quality management plans and groundwater quality management plans) rather than things they must do now. Coastkeeper directs our attention, again, to surface water quality management plans and groundwater quality management plans, which are required when water quality objectives are exceeded and irrigated agriculture may have caused or contributed to the exceedance. Coastkeeper argues the Order gives “unfettered discretion” to the Coalition to develop surface water quality management plans and groundwater quality management plans, and leaves the task of identifying management practices that will address the exceedance to the indefinite future. Coastkeeper suggests the Coalition cannot be relied upon to develop meaningful plans for Members, and Members cannot be trusted to regulate themselves. These arguments fail for several reasons.

First, surface water quality management plans and groundwater quality management plans are not as toothless as Coastkeeper suggests. True, they are developed by the Coalition, and the Coalition may not know in advance which management practices should be implemented to address which exceedances. But the Nonpoint Source Policy recognizes that management practice implementation must be iterative and adaptive, and the Order requires that surface water quality management plans and groundwater quality management plans identify management practices that will be used to control the exceedance and provide a specific schedule for implementing them. The Order further requires that surface water quality management plans and groundwater quality management plans be submitted to the Central Valley Water Board and approved by the executive officer following public review and comment. And the Order requires that Members comply with management plans once approved by the executive officer, and submit management practice implementation reports to the Coalition verifying that they have done so. The Coalition, for its part, must evaluate the Member's implementation of management practices and assess their effectiveness in annual management plan progress reports to the Central Valley Water Board. Thus, surface water quality management plans and groundwater quality management plans are more than mere "plans to make a plan."

Second, Coastkeeper's challenge to surface water quality management plans and groundwater quality management plans does not establish any insufficiency of the evidence. Ultimately, Coastkeeper argues the program cannot be considered highly likely to attain to water quality requirements because the Coalition cannot be counted on to develop meaningful surface water quality management plans and ground water quality management plans. However, the Nonpoint Source Policy encourages the State Water Board and Regional Boards to build upon third-party programs. That Coastkeeper may harbor doubts about the Coalition's ability to regulate Members does not mean the trial

court's ruling lacks substantial evidence. Coastkeeper fails to establish any violation of key element two.

2. *Key Element Four*

Coastkeeper's next set of arguments focus on the Order's surface water monitoring program and key element four.²⁶ As previously discussed, the General WDRs divide the watershed into six zones, each with two core sites and additional represented sites. (See Section II.B.2.a, *ante*.) The two core sites are continuously monitored, with each site monitored for two years at a time on an alternating basis. When monitoring reveals an exceedance, the Coalition monitors the core site for an additional year and evaluates nearby represented sites to determine whether water quality problems may be occurring there as well. The Order maintains this framework but questions whether "the current monitoring and reporting program requirements constitute a sufficient feedback system to verify that appropriate management practices are being proposed and implemented." The Order concludes such questions should be considered as part of an independent peer review, and directs the Central Valley Water Board to implement an expert review process to evaluate the monitoring framework and make recommendations for improvements.

Coastkeeper argues the surface water monitoring program violates key element four in several ways. First, Coastkeeper argues the surface water monitoring program violates key element four by relying on an approach rejected in a declaratory judgment and order in *California Sportfishing Protection Alliance, et al. v. California Regional Water Quality Control Board, et al.*, Sacramento Superior Court case No. 34-2012-

²⁶ Key element four provides that "[a nonpoint source] control implementation program shall include sufficient feedback mechanisms so that the [Regional Board], dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different [management practices] or other actions are required." (Emphasis omitted.)

80001186 (*CSPA*). Although Coastkeeper spends considerable time on *CSPA*, the trial court here did not rely on that case, and it is neither citable nor binding on us.

Accordingly, we decline to consider Coastkeeper's arguments based on *CSPA*.

Second, Coastkeeper argues the surface water monitoring program violates key element four by relying on aggregated and anonymized data from farm evaluations and irrigation and nitrogen management summary reports. According to Coastkeeper, aggregated and anonymized data obscures the link between implemented management practices and expected water quality outcomes, and thus fails to provide sufficient feedback mechanisms. Although Coastkeeper focuses on the Order's surface water monitoring program, rather than monitoring programs generally, Coastkeeper's arguments are fundamentally the same as the Foundation's and we reject them for the same reasons.

Third, Coastkeeper argues the surface water monitoring program does not generate enough data to allow the Central Valley Water Board and public to determine whether the program is working. This is so, Coastkeeper says, because the program divides the watershed into overly large zones, the Coalition only monitors core sites for two years at a time on an alternating basis, and the Coalition only monitors representative sites for the particular contaminant found to have caused an exceedance at the core site, rather than all contaminants of concern. Given these deficiencies and the State Water Board's unanswered questions, Coastkeeper argues the State Water Board "could not have found a 'high likelihood' that the [Order] would meet water-quality objectives, as the Nonpoint Source Policy requires." But Coastkeeper here paraphrases the commentary to key element two, not key element four.²⁷ Key element four does not require a "high

²⁷ As previously discussed, the commentary to key element two provides, in part, that a Regional Board "must be able to determine that there is a high likelihood that the program will attain water quality requirements." (See Section III.C.1, *ante*.)

likelihood” finding, and Coastkeeper does not argue the surface water monitoring program violates key element two. Coastkeeper’s argument thus fails.

Fourth, and finally, Coastkeeper takes aim at the trial court’s determination that the weight of the evidence supports a finding that “properly scaled representative monitoring [is] appropriate.” Coastkeeper argues no evidence supports any such finding, and suggests the State Water Board effectively conceded as much by directing the Central Valley Water Board to implement an expert review process.²⁸ We are not persuaded.

As previously discussed, the Order explains that the Panel considered appropriate frameworks for surface water quality monitoring and expressed the view, shared by the State Water Board, that receiving water monitoring is preferable to field-specific monitoring for reasons of cost and efficiency. Accordingly, the State Water Board found: “Receiving water monitoring is a reliable and effective methodology for identifying water quality issues without resorting to more costly end-of-field measurements.” The General WDRs call for receiving water monitoring, and substantial evidence supports the trial court’s implied finding that receiving water monitoring is appropriate.

²⁸ Coastkeeper advances additional arguments that require only brief consideration. First, Coastkeeper argues the trial court confused the Order’s requirements for groundwater monitoring with its requirements for surface water monitoring. Even assuming that Coastkeeper is correct, the error would not deprive the trial court’s finding of substantial evidence, for the reasons stated in the text.

Second, Coastkeeper argues the trial court failed to give due consideration to an opinion by Dr. Revital Katznelson. As the trial court explained, however, Coastkeeper did not offer Dr. Katznelson’s opinion until its reply brief. As such, the trial court was not required to consider it at all.

Third, Coastkeeper argues the trial court incorrectly viewed the Order as a waiver of waste discharge requirements, rather than waste discharge requirements. However, the trial court corrected the error, and we review the corrected ruling. The error, in any case, does not change our review or conclusions.

The General WDRs also call for “representative” monitoring. We understand the term “representative monitoring” to refer to monitoring that takes place at representative sites, rather than farm-specific sites. The State Water Board, in finding that receiving water monitoring is reliable and effective, implicitly recognized that some form of representative monitoring was also appropriate. (See *Monterey Coastkeeper I, supra*, 28 Cal.App.5th at p. 366 [“both . . . section 13269 and the [Nonpoint Source Policy] expressly allow the use of group or watershed monitoring”].)

The Panel recommended that “sampling” of receiving waters “should be of sufficient density (spatially and temporally) to identify general locations of possible pollution.” “For example,” the Panel continued, “a single measurement point at the downstream discharge of a very large watershed would be insufficient.” But the Panel did not say what density of sampling would be sufficient. This was chief among the questions the State Water Board referred to the new expert panel.

The State Water Board found the surface water monitoring program established by the General WDRs reflects “a studied decision by the Central Valley Water Board to balance the [Coalition’s] monitoring costs with the need to increase funds for management practice implementation.” (See § 13267, subd. (b) [“The burden, including costs, of [monitoring program reports] shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports”].) The State Water Board further found the Central Valley Water Board’s representative monitoring approach “appears to have some merit” and “may be reasonable.”

The State Water Board clearly believed the representative monitoring approach set forth in the General WDRs was appropriate (or sufficient) until the question of density (or scale) could be considered by the new expert panel. Thus, the State Water Board found that representative monitoring was appropriate, and monitoring should be “properly scaled” (in the trial court’s parlance) or “of sufficient density” (in the Panel’s). Substantial evidence thus supports the trial court’s finding that the State Water Board

“concluded that properly scaled representative monitoring was appropriate.” That the State Water Board referred the question of what constitutes “sufficient density” to another expert panel does not mean the surface water monitoring program was not appropriate (or sufficient) based on information available to the State Water Board at the time, and does not render the trial court’s finding unsupported by the evidence. We reject Coastkeeper’s argument.

D. Protectores’ Appeal

Unlike the Foundation and Coastkeeper, Protectores argues the Order violates the Antidegradation Policy, rather than the Nonpoint Source Policy. Specifically, Protectores argues: (1) the State Water Board’s maximum benefit finding either was not supported by substantial evidence or was contrary to the evidence; (2) the trial court failed to exercise independent judgment in concluding the weight of the evidence supported the finding; and (3) the State Water Board “improperly distinguished” *AGUA*. We address these contentions in turn.

1. The Maximum Benefit Finding

As we have explained, the Antidegradation Policy requires that the State Water Board or Regional Board make findings that any change in water quality (1) will be consistent with the maximum benefit to the people of the state, (2) will not unreasonably affect beneficial uses, and (3) will not violate water quality standards. (*AGUA, supra*, 210 Cal.App.4th at p. 1260.) The trial court independently reviewed the administrative record and found the State Water Board made each of the required findings. Protectores challenges the evidence supporting the maximum benefit finding. Protectores argues the finding was not supported by substantial evidence or was contrary to the evidence because the State Water Board failed to consider costs to the public of discharges authorized by the Order, including treatment and health costs. We disagree.

The Antidegradation Policy does not define “maximum benefit to the people of the state.” However, the State Water Board has discussed the maximum benefit finding in a

guidance memorandum. (State Water Board, Guidance Mem. (Feb. 16, 1995) (Guidance Memorandum).) The Guidance Memorandum, which was excerpted in *AGUA*, explains that maximum benefit determinations should be made on a case-by-case basis, with consideration given to various factors, including “ ‘economic and social costs, tangible and intangible, of the proposed discharge compared to the benefits.’ ” (*AGUA, supra*, 210 Cal.App.4th at p. 1279, quoting Guidance Mem. at pp. 4-5.)

The trial court found the State Water Board made the maximum benefit finding, and the finding was supported by the weight of the evidence. Substantial evidence supports the trial court’s determination. The Order reveals that the State Water Board upheld the Central Valley Water Board’s maximum benefit finding, which was based on findings from an environmental impact report that was attached as an exhibit to the Order. That report includes findings that the state depends on central valley agriculture for food and central valley communities rely on agriculture for employment.

The State Water Board observed that the Central Valley Water Board considered social costs of the discharges authorized by the Order and found the Order’s requirements “should ensure that local communities not incur any additional treatment costs.” The State Water Board also observed that the new monitoring program for drinking water supply wells would mitigate social costs by requiring that Members provide replacement water to affected communities. Accordingly, the State Water Board found “considerable societal benefits outweigh the costs associated with the effects of irrigated agriculture under the [Order],” and any degradation authorized by the Order “is consistent with the maximum benefit to the people of the state.” Substantial evidence supports the trial court’s determination that the State Water Board made the maximum benefit finding, and the finding was supported by the weight of the evidence.

Protectores offers a different perspective. Protectores directs our attention to the following sentence from the Order’s discussion of the maximum benefit to the people of the state: “The Central Valley Water Board considered social costs of the discharges and

reasonably concluded that the General WDRs' requirements to address all exceedances of water quality objectives according to the terms of a time schedule, implement best practicable treatment and control where irrigated agricultural waste discharges may cause degradation, and the inclusion of performance standards that work to prevent further degradation of surface and groundwater quality, should ensure that *local communities not incur any additional treatment costs associated with the limited degradation authorized by the General WDRs.*" (Emphasis added.) Protectores interprets the italicized language in the above-quoted sentence as a "finding that the public will incur no costs."

Protectores challenges the purported finding that "the public will not incur costs" at length. Protectores explains that discharges from irrigated agriculture are a primary cause of nitrate pollution, nitrates are dangerous in drinking water, many people rely on groundwater contaminated with nitrates for drinking water, treating contaminated water is costly, and the Order allows such discharges to continue. Protectores then concludes the State Water Board's purported finding cannot be squared with the evidence.

There are at least two problems with Protectores' argument. First, Protectores invites us to make our own maximum benefit finding, placing greater weight on evidence of social costs than the State Water Board did, which we cannot do. Second, the State Water Board did not say the public would incur "no costs" associated with the degradation authorized by the Order. The State Water Board said the public should not incur "any additional treatment costs" associated with the degradation authorized by the Order.

We see an obvious difference between the finding the State Water Board actually made and the one Protectores attributes to it. That the State Water Board found local communities would be unlikely to incur "any additional treatment costs" as a result of the degradation authorized by the Order does not mean they would incur "no costs," as Protectores contends. It means only that local communities would be unlikely to incur *additional* costs, above and beyond those already being incurred. This much seems clear

from the very next sentence of the Order, which provides, in part, “if monitoring of drinking water supply wells indicates that [maximum contaminant levels] are being exceeded, we expect dischargers that are causing or contributing to the exceedance to provide replacement water to the affected population.” The State Water Board thus found, not “that the public will incur no costs,” but that local communities would be unlikely to incur “additional treatment costs,” because the new requirements for monitoring drinking water supply wells would ensure that the costs of treating exceedances would be borne by Members. Protectores does not suggest the State Water Board’s actual finding was contrary to the evidence or unsupported by substantial evidence, and so we have no occasion to consider that question. Substantial evidence supports the trial court’s determination that the State Water Board’s maximum benefit was supported by the weight of the evidence.²⁹ We therefore reject Protectores’ first argument.

2. *The Trial Court’s Independent Judgment*

Protectores next argues the trial court failed to exercise independent judgment in evaluating the evidence supporting the maximum benefit finding. As before, Protectores attempts to demonstrate error by mischaracterizing the State Water Board’s maximum benefit finding. Once again, the argument fails.

Protectores’ argument focuses on the following portion of the trial court’s ruling: “Protectores argues that degradation is occurring, which imposes costs, but the [Order] will allow dischargers up to [10] years to come into compliance. Protectores does not quantify these costs, but suggests that such costs are borne by persons in communities

²⁹ Protectores also argues the State Water Board failed to consider the severity and extent of the degradation authorized by the Order in making the maximum benefit finding. That argument is not properly before us, as Protectores presented it to the trial court for the first time in its reply papers.

served by groundwater wells, or communities which must pay for additional treatment of nitrate-contaminated groundwater. Protectores also suggests that because the order only requires township-level groundwater protection targets, groundwater monitoring will allow exceedances at ‘hot spots’ within communities that may go undetected. *The Court does not doubt that such costs exist.* However, Protectores bears the burden of demonstrating that the State Board did not appropriately consider these costs.” (Emphasis added.)

Protectores seizes on the trial court’s statement that “such costs exist.” As Protectores reads the ruling, the trial court believed degradation authorized by the Order would cause local communities to incur costs, but deferred to the State Water Board’s purportedly contrary finding that they “would not incur additional treatment costs,” thereby abdicating its responsibility to exercise independent judgement. This argument fails for much the same reason as the last: Saying that social costs “exist” does not deny that “additional treatment costs”—i.e., treatment costs over and above the existing ones—are unlikely to become necessary.

That no conflict exists between the trial court’s statement and the State Water Board’s finding is clear from the relevant sentence of the Order, which can be truncated as follows: “The Central Valley Water Board considered social costs of the discharges and reasonably concluded that the General WDRs’ requirements . . . should ensure that local communities not incur any additional treatment costs associated with the limited degradation authorized by the General WDRs.” The Order thus acknowledges that social costs “exist,” and were reasonably considered by both the Central Valley Water Board and State Water Board. Nothing suggests the trial court abdicated its responsibility to exercise independent judgment, and we will not assume the court misunderstood or misapplied the law. (*People v. Jeffers* (1987) 43 Cal.3d 984, 1000 [“It is generally presumed that a trial court has followed established law”].)

Finally, Protectores argues the State Water Board misinterpreted or misapplied *AGUA*. Apart from its challenge to the evidence supporting the maximum benefit finding (which we have already rejected), Protectores does not suggest the State Water Board failed to make any of the findings required by the Antidegradation Policy. Instead, Protectores suggests the State Water Board went wrong by distinguishing *AGUA* and conducting a “nontraditional” antidegradation analysis. This argument goes nowhere.

AGUA concerned an order authorizing waste discharges from dairy farms in the Central Valley (dairy order). (*AGUA, supra*, 210 Cal.App.4th at pp. 1258-1259.) The Central Valley Water Board, in adopting the dairy order, found the Antidegradation Policy did not apply. (*Id.* at p. 1260.) The *AGUA* court disagreed. (*Ibid.*) The court then considered whether the dairy order complied with the Antidegradation Policy. (*Id.* at p. 1278.)

Relying on the Guidance Memorandum, the *AGUA* court concluded that the Antidegradation Policy requires that Regional Boards make required findings as part of a “two-step process.” (*AGUA, supra*, 210 Cal.App.4th at p. 1278.) The court explained: “ ‘The first step is if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality (1) will be consistent with maximum benefit to the people of the State, (2) will not unreasonably affect present and anticipated beneficial use of such water, and (3) will not result in water quality less than that prescribed in state policies (e.g.[.] water quality objectives in Water Quality Control Plans). The second step is that any activities that result in discharges to such high quality waters are required to use the best practicable treatment or control of the discharge necessary to avoid a pollution or nuisance and to maintain the highest water quality consistent with the maximum benefit to the people of the State.’ ” (*Ibid.*, quoting Guidance Mem. at p. 2.)

Protectores argues the State Water Board erred in distinguishing *AGUA*. However, the Order does not announce any departure from *AGUA*. The Order observes that the State Water Board “has, to date, provided relatively little specific direction to the

regional water boards on how to apply the Antidegradation Policy to nonpoint sources.” The Order continues: “We recently explained that a traditional antidegradation analysis for a discrete point source discharge has limited value when considering antidegradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a region.” The Order opines that the same practical considerations “make it inappropriate to apply a discrete point source discharge approach in the context of a general order regulating both surface water and groundwater discharges from irrigated agriculture operations across a large landscape.” The Order does not discuss *AGUA*, except to say “[t]he diffuse, landscape level groundwater discharges regulated under the . . . General WDRs[,] are unlike the concentrated discharges from dairy retention ponds and corral areas that were the subject of” *AGUA*. The Order thus observes that discharges from irrigated agricultural operations are different from discharges from dairy operations. This observation does not appear to have been offered as a shot across *AGUA*’s bow. Rather, the State Water Board appears only to have been commenting upon the lack of guidance addressing application of the Antidegradation Policy and noting that what little guidance exists has involved discrete point source pollution or forms of nonpoint source pollution more concentrated and less diffuse than discharges from irrigated agriculture (such as manure), and therefore more amenable to a “traditional antidegradation analysis.”

The Order does not “distinguish” *AGUA* by suggesting the Antidegradation Policy does not apply to nonpoint source pollution. The Order does not reject or refuse to follow the “two-step process” described in *AGUA*. (*AGUA, supra*, 210 Cal.App.4th at p. 1278.) To the contrary, the Order undertakes an antidegradation analysis, making the findings described in *AGUA*. (*Id.* at pp. 1278-1286.) The trial court determined the State Water Board and Central Valley Water Board made the required findings, and substantial evidence supports the court’s determination, as we have shown. (See Section III.D.1, *ante.*)

Protectores makes much of the Order's use of the phrase "traditional antidegradation analysis," suggesting the State Water Board, in recognizing the "limited value" of such an analysis in the context of storm water discharges from diffuse sources, declared an intention to employ a "nontraditional" analysis here. But again, Protectores does not tell us how the Order breaks with tradition. Indeed, the only part of the antidegradation analysis that appears to us at all "nontraditional" is the Order's discussion of baseline water quality.

As previously discussed, the Antidegradation Policy requires that the Regional Board compare the baseline water quality (the best quality that has existed since 1968) to the water quality objectives. (*AGUA, supra*, 210 Cal.App.4th at p. 1270.) Here, the State Water Board determined that "it will be impossible for the regional water boards to establish an accurate numeric baseline for potentially hundreds of waterbodies and dozens of waste constituents in an area covered by a general order." Rather than require an "impossible" undertaking, the State Water Board concluded that "regional water boards must conduct a general assessment of the existing water quality data that is reasonably available." The Central Valley Water Board's "general antidegradation analysis" was the only part of the Order that can fairly be described as meaningfully different from a "traditional antidegradation analysis." And that analysis merely determined that the Antidegradation Policy applies. It did not do violence to the Antidegradation Policy or *AGUA*. Protectores argument to the contrary is without merit.

III. DISPOSITION

The judgments are affirmed. Respondents shall recover their costs on appeal.
(Cal. Rules of Court, rule 8.278(a)(1) & (2).)

/S/

RENNER, J.

We concur:

/S/

ROBIE, Acting P. J.

/S/

MAURO, J.

APPENDIX

TABLE 1

Sample Field-Level Management Practice Data Reported to the Regional Board by Anonymous Member ID*

ID	Data from INMP Summary Report						Data from Farm Evaluation			Data from MPR			
	Anonymous Member ID	Crop	Outlier Notification? (Annual)	INMP Certification Method (Annual)	Irrigation Method	Irrigation Practices (Annual)	Nitrogen Management Practices (Annual)	Pest Management Practices (Every Five Years)	Sediment and Erosion Management Practices (Every Five Years)	Irrigation wells? Abandoned wells? (Every Five Years)	In a SQMP area? (Annual)	Practices Implemented to comply with SQMP	In a GQMP area?
243721	Tom alt ₁	Yes	CCA	Drip	Measured soil moisture	Evaluated crop nitrogen need; used fertigation	Followed label restrictions	Used off season cover crop	Yes, No	No	NA	No	NA
243721	Tom alt ₂	No	CCA	Drip	Weather-based measured soil moisture	Used tissue/petiole testing	Used drift control agents	Stabilized creek and stream banks	Yes, Yes	No	NA	No	NA
243721	Corn	No	Self	Furrow	Tailwater return	Used split fertilizer applications	none	No irrigation drainage	Yes, Yes	No	NA	No	NA
341962	Almond	No	NRCS	Drip	Weather-based scheduling	Used split fertilizer applications	Used buffer zones	Field is lower than surrounding terrain	Yes, No	Yes	Limited edge of field spraying	Yes	Used split fertilizer application
810619	Corn	No	GGA-N/A	Furrow	Tailwater return	Tested irrigation water nitrogen concentration	Used vegetated drain ditches	Flow dissipates, stabilized creek and stream banks	No, No	Yes	Integrated pest management	No	NA
810619	Alfalfa	Yes	Self-N/A	Border flood	Laser-leveled fields	none	Applied no pesticides	Used in-furrow dams	No, Yes	Yes	Integrated pest management	No	NA
781936	Almond ₁	No	CCA	Sprinkler	Measured soil moisture	Tested soil for residual nitrogen	Mapped sensitive areas	Irrigated with drip or micro irrigation syst.	Yes, No	No	NA	Yes	Compost added to soil
781936	Almond ₂	No	CCA	Flood	Irrigation based on crop water need	Tested soil for residual nitrogen	Used end-of-row sprayer shutoff	Planted cover crops or native vegetation	Yes, Yes	No	NA	Yes	Compost added to soil

*The data in this table is for illustrative purposes only and does not represent actual data collected.

TABLE 2

Sample Field-Level Nitrogen Data Reported to the Regional Board by Anonymous Member ID*

Anonymous Member ID	Crop for each field	N Applied			Total Nitrogen Applied (lbs/ac)	Nitrogen Removed (lbs/ac)	A/R	A-R	
		N Applied via Fertilizer (lbs/ac)	N Applied via Organics/Compost (lbs/ac)	N Applied via Irrigation (lbs/ac)				(lbs/ac)	3 yr A/R
243721	Tomato ₁	180	10	6	196	148	1.3	48	1.3
243721	Tomato ₂	150	0	45	195	60	3.3	135	3.7
243721	Corn, silage	230	0	17	247	210	1.2	37	1.4
341962	Almond	180	5	22	207	140	1.5	67	1.3
810619	Corn, grain	200	0	5	205	120	1.7	85	1.6
810619	Alfalfa	0	0	35	35	510	0.1	-475	0.1
781936	Almond ₁	250	0	0	250	130	1.9	120	2.1
781936	Almond ₂	135	10	31	176	54	3.3	122	3.6

*The data in this table is for illustrative purposes only and does not represent actual data collected. If multiple crop types are grown in the same field over the course of a year or over several years, variations on field nomenclature and crop reporting will be necessary. For example, the field could be identified as the same field in an extra column and an extra row could be added for each crop.

TABLE 3

Sample Field-Level Nitrogen Data Reported to the Regional Board by Anonymous APN ID*

Anonymous APN ID	Groundwater Sub-basin (Per DWR Bulletin 118)	Crop for each field	N Applied			Total Nitrogen Applied (lbs/ac)	Nitrogen Removed (lbs/ac)	A-R		
			N Applied via Fertilizer (lbs/ac)	N Applied via Organics/Compost (lbs/ac)	N Applied via Irrigation (lbs/ac)			A/R	A-R (lbs/ac)	3 yr A/R
AQRTM	5-22.02	Tomato ₁	180	10	6	196	148	1.3	48	1.3
AQRTM	5-22.02	Tomato ₂	150	0	45	195	60	3.3	135	3.7
AQRTM	5-22.02	Com, silage	230	0	17	247	210	1.2	37	1.4
GJZQN	5-22.04	Almond	180	5	22	207	140	1.5	67	1.3
MNOPR	5-22.04	Almond	180	5	22	207	160	1.3	47	1.2
CFRMO	5-22.03	Com, grain	110	0	5	115	92	1.3	23	1.6
QZIFE	5-22.02	Corn, grain	110	0	5	115	92	1.3	23	1.6
QZIFE	5-22.02	Alfalfa	135	10	31	176	54	3.3	122	3.6
ROTBM	5-22.06	Almond	250	0	0	250	130	1.9	120	2.1
LGTVI	5-22.04	Almond	135	10	31	176	54	3.3	122	3.6

*The data in this table is for illustrative purposes only and does not represent actual data collected. If multiple crop types are grown in the same field over the course of a year or over several years, variations on field nomenclature and crop reporting will be necessary. For example, the field could be identified as the same field in an extra column and an extra row could be added for each crop.

TABLE 4

Sample Township-Level Nitrogen Data Reported to the Regional Board*

Township Range (TR)	Crop	Total Acreage (ac)	N Applied via Fertilizer (total lbs)	N Applied via Organics/Compost (total lbs)	N Applied via Irrigation (total lbs)	Total Nitrogen Applied (total lbs)	Nitrogen Removed (total lbs)	A/R	A-R (total lbs)
02S07E	Almonds	88	20000	60	2390	22450	22400	1.0	50
02S07E	Corn, silage	54	12420	0	650	13070	11340	1.2	1730
02S07E	Walnuts	35	5250	0	500	5750	3575	1.6	2175
05S14E	Almonds	115	20700	0	3540	24240	16100	1.5	8140
05S14E	Corn, grain	600	66000	250	0	66250	55200	1.2	11050
05S14E	Grapes	112	2800	75	200	3075	3140	1.0	-65
05S14E	Oats	32	--	--	--	--	--	--	--
05S14E	Pistachios	1293	155160	0	3550	158710	108612	1.5	50098
05S14E	Wheat	1040	156000	200	900	157100	104000	1.5	53100
06S09E	Almonds	38	5700	0	705	6405	2052	3.1	4353
06S09E	Corn, grain	2144	235840	0	9858	245698	197248	1.2	48450
07S11E	Almonds	4696	657440	2000	3250	662690	422640	1.6	240050
07S11E	Tomatoes	891	160380	0	9928	170308	131868	1.3	38440
07S11E	Walnuts	105	15750	45	0	15795	8400	1.9	7395
08S13E	Barley	400	57000	200	400	57600	32000	1.8	25600
10S15E	Almonds	9328	2000000	800	14048	2014848	1679040	1.2	335808
10S15E	Corn, grain	387	42570	250	0	42820	35604	1.2	7216
10S15E	Tomatoes	91	12000	30	500	12530	17900	0.7	-5370
10S15E	Walnuts	80	11500	0	50	11550	9600	1.2	1950
11S17E	Almonds	9817	1511000	0	820	1511820	1079870	1.4	431950
11S17E	Corn, silage	54	12420	0	650	13070	11340	1.2	1730
11S17E	Walnuts	760	140000	300	6000	146300	66500	2.2	79800
13S17E	Almonds	1724	410000	0	3760	413760	258600	1.6	155160
13S17E	Tomatoes	186	19500	10	0	19510	1467	13.3	18043
13S17E	Walnuts	189	30000	200	1550	31750	6250	5.1	25500

*The data in this table is for illustrative purposes only and does not represent actual data collected.